CAAM 335 · MATRIX ANALYSIS

Spring 2018 · Rice University

Lectures:	MWF 9:00–9:50AM, Duncan Hall 1064
Web Site:	http://www.caam.rice.edu/~caam335
Instructors:	Nabil Chaabane (nabil.chaabane@rice.edu), Duncan Hall 2001, Office Hours: Mondays 1-2pm, Duncan Hall 2001.
Recitations:	TBA.
Teaching Assistant:	TBA.
Course objectives:	Students should learn how to characterize the solution of systems of linear equations and linear least squares problems, apply basic solution techniques to linear problems involving electrical circuits and planar trusses, compute the eigendecompsition of matrices and apply it to solve linear dynamical systems, and compute the eigenvalue problem and Laplace transform via complex integration.
Outcomes:	Apply the Fundamental Theorem of Linear Algebra to characterize solutions of linear systems. Solve linear systems and linear least squares problems, and apply these techniques to problems involving electrical circuits and planar trusses. Compute eigenvalues and eigenvectors of matrices. Apply the eigendecomposition to solve linear dynamical systems. Compute the eigendecomposition and inverse Laplace transform via complex integration. Compute the singular value decomposition and it apply it to solve linear least squares problems.
Prerequisites:	(MATH 212 or MATH 222) AND CAAM 210. Less formally: you should be familiar with multivariable calculus and elementary matrix manipulations (matrix addition and multiplication, Gaussian elimination), and be able to write MATLAB programs.

Grading: 40% homeworks, 60% exams. (Class participation and improving performance on the exams will be considered when assigning borderline grades.)

Homeworks: Homeworks will be assigned roughly once a week. Typically a homework assignment is due one week after it has been posted. Unless otherwise stated, you may collaborate with other students, but you must write up your solutions separately. *You may not consult solutions from previous sections of this class.*
Most problem sets will be assigned via the CANVAS course site. *Visit the CANVAS site and the course web-page regularly.*
The lowest homework grade will be dropped.

Exams: There are three exams. Each exam will each account for 20% of the final grade. The final exam is scheduled. Room and time for the 3rd exam will be determined by the Registrar's office later this semester.
Each exam must be your individual, unassisted effort; indicate compliance by writing out in full and signing the traditional pledge.

Late Policy: Homeworks and exams must be turned in on time.

Required Reading: *Linear Algebra in Situ (Fall 2017 Edition)* by Steven Cox. Available as a course pack from the campus store.
Supplemental notes are available on the CANVAS course site and updated as the semester progresses.

Recommended Reading: Carl Meyer, *Applied Matrix Analysis and Linear Algebra*
Gilbert Strang, *Linear Algebra and Its Applications*, 3rd ed.
Gilbert Strang, *Introduction to Applied Mathematics*
Lars Ahlfors, *Complex Analysis*, 3rd ed.
J. W. Brown & R. V. Churchill, *Complex Variables and Applications*, 8th ed.
D. J. Higham & N. J. Higham, *MATLAB Guide*

Programming: Homework assignments may require MATLAB programming. Your solutions should adhere to good programming standards, and must not be copied from other students.

Any student with a disability requiring accommodation in this course is encouraged to contact the instructor during the first week of class, and also to contact Disability Support Services in the Ley Student Center.